

From Kennett to Tehama the Sacramento showed little departure from the usual June stages. South of Colusa, however, the river averaged from 2 to over 6 feet below the normal for the month and was the lowest on record, except the extreme low-water stages of June, 1910.

The American River fell slowly but steadily during the entire month, with a range of over 3 feet between the highest on the 1st and the lowest on the 30th. It averaged nearly 2 feet below the usual June stage and only 0.7 of a foot above the previous lowest water for the month, which was in 1910.

At Oroville on the Feather and Marysville on the Yuba River the averages were 1.5 and 2.1 feet, respectively, below the June normal. Stages at both points were slightly above those of June, 1910.

Conditions now indicate that all streams in this watershed will be unusually low during the late summer and early fall; that the Sacramento River itself will reach unprecedentedly low stages.

Lower San Joaquin watershed.—The snow in the high ranges east of the San Joaquin Valley practically disappeared during the last decade of May, and the effect of snow water on the run-off of the mountain streams was barely noticeable even during the first warm days of June.

Excepting the Tuolumne, which rose over 2 feet during the 24 hours ending at 7 a. m. of the 27th, as a result of heavy local rains, all streams fell steadily during the greater part of the month and averaged much below the June normal. The extreme low-water stages will be reached much earlier than usual in all streams in the San Joaquin Valley.

NOTES ON STREAMS OF THE UPPER SAN JOAQUIN WATERSHED.

By JAMES H. GORDON, Observer.

The past month has been one of low water, with almost an entire absence of high stages. A rather scanty snow cover is largely responsible for this condition, but the moderate temperatures of the month contributed. For Firebaugh and Friant on the San Joaquin River the stages for June were the lowest in 7 years' record. Ten years' record for the Kings River shows but one year with lower flow, 1908, while the Merced River gave lower stages both in 1908 and 1910.

Low water in the Kings River, from which most of the irrigating canals of Fresno County draw their supply, has

resulted in much litigation between the various water users. The loss in crops will not be nearly so severe as might be expected, for the past dry years have shown the need of a reliable water supply and ranchers generally have wells and pumping plants. The supply of ground water seems to be plentiful in spite of the two dry seasons.

RELATIVE HUMIDITY IN DEATH VALLEY.

By ALEXANDER G. McADIE.

Hydrographic records from Greenland ranch, Death Valley, Cal., have been maintained for a year. The instrument, a Friez hygrometer, has been twice carefully checked at the Weather Bureau office, San Francisco. The readings are also under control at Greenland ranch by the use of a sling psychrometer. Mr. Fred Corkhill, superintendent at the ranch, formerly called Furnace Creek ranch, has given special attention to the keeping of these records, and Mr. W. L. Locke, of the Pacific Coast Borax Co., has from time to time studied the humidity records in connection with other climatic factors.

It may be stated that while humidities are low, as might be expected, there are periods when a high degree of saturation prevails. A notable instance of this was from the forenoon of October 2 until the forenoon of October 18, 1912, when during the night hours the relative humidity frequently exceeded 90 per cent, while during the midday and afternoon hours the humidity did not fall below 50 per cent during most of the period.

Taking the year's record as a whole it appears that the humidity is not much below that of the Great Valley of California and closely resembles conditions in the San Gabriel Valley. These records would appear to uphold the belief that the dreaded terrors of heat and dryness in Death Valley have been somewhat exaggerated; and that it is quite possible if proper care be taken in the matter of supplies and provision for physical comfort, to live and work in this section.

The highest temperature recorded in California during June, 1913, was 119° on the 22d at Greenland ranch. Mr. Locke states that the maxima during the month ranged from 105° to 119°. During the first week of June the humidity was not high and the weather not oppressive. The lowest humidity reported during the month was 16 per cent. He adds that on July 3 and 4 the Weather Bureau thermometer registered 125°.